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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Ron McCabe et al.

Serial No.: 09/438,184

Group Art Unit: 2153

Filed: November 11, 1999

Examiner: Dinh, Dung C.

For: **FLEXIBLE REMOTE DATA MIRRORING**

TRANSMITTAL LETTER

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Commissioner for Patents
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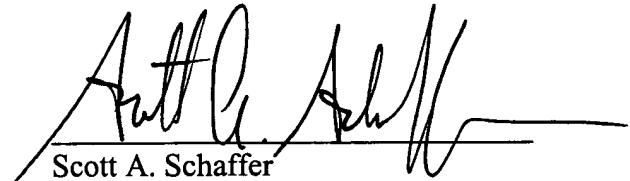
Enclosed for filing in the above-referenced application are the following:

- ☒ Appellant's Brief (in Support of Appeal), in triplicate
- ☒ Appendix
- ☒ PTO Form 2038 authorizing credit card payment in the amount of \$165.00 for the above-listed fee
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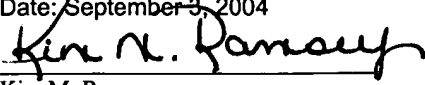
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Date: September 3, 2004


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**APPELLANT'S BRIEF
UNDER 37 C.F.R. § 1.192**

Appeal is taken from the Examiner's Office Action mailed January 7, 2004 finally rejecting claims 1-88, 101, 103, 104, 106, 108, and 109 in this application.

This Appeal Brief is further to the Notice of Appeal mailed in this case on July 6, 2004.

The fees required under §1.17(c) are dealt with in the accompanying Transmittal of Appeal Brief.

This Brief is transmitted in triplicate.

This Brief contains these items under the following headings, and in the order set forth below.

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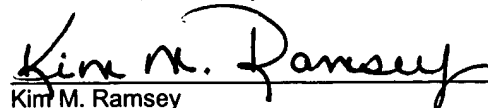

Kim M. Ramsey

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I. REAL PARTY IN INTEREST 37 C.F.R. § 1.192(c)(1)

The real party in interest is as named in the caption of this Brief (the inventors) and the assignee of the present application, Miralink Corporation.

II. RELATED APPEALS AND INTERFERENCES 37 C.F.R. § 1.192(c)(2)

There are no other appeals or interferences known to Appellant, the Appellant's representative, or assignee that will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS 37 C.F.R. § 1.192(c)(3)

Status of All the Claims:

- 1. Claims presented: 1-88, 101, 103, 104, 106, 108, and 109
- 2. Claims withdrawn from consideration but not cancelled: NONE
- 3. Claims cancelled: 89-100, 102, 105, and 107
- 4. Claims cancelled for appeal: 1-5, 7-26, 46-88, 101, 103, 104, 106, 108 and 109

5. Claims pending for appeal: 6 and 27-45

a. Claims allowed: NONE

b. Claims rejected: ALL

Only claims 6 and 27-45 are being appealed. The appealed claims are eligible for appeal, having been finally rejected.

IV. STATUS OF AMENDMENTS **37 C.F.R. § 1.192(c)(4)**

Subsequent to the last Office Action mailed on January 7, 2004, which contained a Final Rejection of the appealed claims, no amendment has been filed.

V. SUMMARY OF THE INVENTION **37 C.F.R. § 1.192(c)(5)**

The invention describes systems and methods for providing a flexible data mirroring technique. In particular, the invention provides many-to-one data mirroring, including mirroring from local servers running the same or different operating systems and/or file systems at two or more geographically dispersed locations. The invention also provides one-to-many data mirroring, mirroring with or without a dedicated private telecommunications link, and mirroring with or without a dedicated server or another server at the destination(s) to assist the remote mirroring unit(s). In addition, the invention provides flexibility by permitting the use of various combinations of one or more external storage units and/or RAID units to hold mirrored data. Spoofing, SCSI and other bus emulations, and further tools and techniques are used in various embodiments of the invention.

VI. ISSUES ON APPEAL **37 C.F.R. § 1.192(c)(6)**

The issue before the Board of Appeals is whether these rejections should be reversed, namely whether it is proper to combine the Staheli, Double-Take, and FrameRunner references to teach the combination of all elements in the claims.

VII. GROUPING OF CLAIMS
37 C.F.R. § 1.192(c)(7)

The claims include two groups of claims. Group I consists solely of claim 6. Group II consists of claims 27-45. Each group stands or falls on its own as incorporating limitations that are each independently patentable.

VIII. ARGUMENT
37 C.F.R. § 1.192(c)(8)

Each group of claims is patentable over the cited references of U.S. Patent No. 5,537,533 to Staheli et al. (hereinafter referred to as “Staheli”), Double-Take: Meeting the New Requirements for Enterprise Data Protection (hereinafter referred to as “Double-Take”), and Channel Networking: FrameRunner (hereinafter referred to as “FrameRunner”). A person of ordinary skill in the art would not combine the three references together in any combination to teach the claimed inventions of the groups. In addition, the references do not individually teach each and every element of the claims in the groups.

A. A person of ordinary skill in the art would not combine any of Staheli, Double-Take, and FrameRunner together.

The Examiner has used improper hindsight in combining the references or has failed to provide a specific suggestion in a particular reference to combine the references.

There must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant. *In re Dance*, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant’s disclosure. MPEP 2143 quoting *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The Examiner’s reasoning for combining the references was that “one of ordinary skill in the art would have been motivated to combine the teaching of FrameRunner and Double-Take to Staheli because it would have improved flexibility and enabled the system to mirror data over existing wide area network.” (Office Action, May, 22, 2003, p. 5, ¶2). This quote is very similar

to the field of the invention in the application. “The present invention ... relates [to] tools and techniques for increasing the flexibility of remote data mirroring by permitting its use in a wider variety of network configurations.” Hence, the Examiners rationale for combining the references had its source in the application itself. This is impermissible hindsight. The suggestion to combine must come from the prior art.

Even if the rationale did not come from the application, the rationale was too general to recite the desirability of making a specific combination. “Improved flexibility” does not provide such specificity. It can be read as generally as “adding a feature.” It is not a specific suggestion to say that references may be combined for the reason that the combination will result in additional features.

Further, enabling the system to mirror data over existing wide area networks, the second rationale stated by the Examiner, simply recites a feature of the references, not a rationale to combine them. Staheli discloses servers for a wide area network (Staheli, col. 8, lines 53-55). Double-Take can operate over wide area connections (Double-Take, p. 9, “Tolerant”). FrameRunner can operate over ATM (FrameRunner, p. 2). ATM is primarily a wide area network backbone technology. Derfler, Frank J., Freed, Les, How Networks Work, Millennium Edition p. 163 (2000). Although this shows that the references have a common feature, the feature is not a specific reference providing desirability or a motivation to combine the references.

Not only is there no suggestion to combine the references, but the references contain mutually exclusive features. Staheli cannot be combined with Double-Take to teach all of the characteristics; Staheli cannot be combined with FrameRunner to teach all of the characteristics; and Double-Take cannot be combined with FrameRunner to teach all of the characteristics. Further, Staheli, FrameRunner, and Double-Take cannot be combined together to teach all of the characteristics.

First, a person of ordinary skill in the art would not combine Staheli with Double-Take. Staheli discloses a system for remote mirroring of digital data (Staheli, Abstract, line 1). In Staheli the server interface 32 receives all of the data that would go to a local disk (Staheli, col. 14, lines 37-42). Staheli emulates a hard disk drive controller (Staheli, col. 10, lines 24-26). On the other hand, Double-Take discloses a data backup system (Double-Take, p. 10). Double-Take sends changes to files or “file deltas” (Double-Take, p. 9). Double-Take uses “Double-Take Source Module” software on the source server (Double-Take, p. 12)

These features of Staheli and Double-Take are mutually exclusive. Staheli transmits any data that goes through the disk controller. Double-Take intercepts the data before it is written to the local file system. Not all data, only “file deltas” are chosen for mirroring. In addition, writing to the file system will occur several steps before writing to the disk controller (See Double-Take, p. 12). Data is intercepted at one point or the other, not both. Further, Double-Take requires the “Double-Take Source Module” software on the server, where Staheli emulates a disk drive. Not only is the data extracted from a different point in the storage system, but Double-Take requires proprietary software for the extraction. Therefore, a person of ordinary skill in the art would not combine the features of Staheli and Double-Take because several of the features are mutually exclusive.

Second, a person of ordinary skill in the art would not combine Staheli with FrameRunner. In addition to the features of Staheli discussed above, Staheli uses a substantially lower amount of bandwidth compared to mirroring an entire file server (Staheli, col. 10, lines 10-13). Staheli can use a 1.5 megabit per second link. Since Staheli emulates a hard disk controller, Staheli does not require a particular storage configuration on the host. In contrast, FrameRunner uses a high speed telecommunications link (FrameRunner, p. 3). FrameRunner operates on a 800 megabit backplane. To take advantage of a 800 megabit backplane, the connection between FrameRunner units would need a bandwidth in excess of 800 megabits per second. In addition, FrameRunner requires the use of the Symmetrix Remote Data Facility (SRDF) software and the EMC Symmetrix enterprise storage systems (FrameRunner, p. 2).

A person of ordinary skill in the art would not combine Staheli with FrameRunner because of these differences. Staheli operates with a 1.5 megabit per second link where FrameRunner needs a high bandwidth link, possibly as much as 800 megabits per second. Staheli can be used in any system that can use the hard disk controller that it emulates. In contrast, FrameRunner only works with EMC Symmetrix hardware and software. These differences teach away from combining Staheli with FrameRunner.

Third, a person of ordinary skill in the art would not combine Double-Take with FrameRunner. In addition to the features of Double-Take discussed above, Double-Take does not require any extra pieces of hardware between the storage units. Double-Take uses the existing network links. See Double-Take, p7, and p. 8. In contrast, FrameRunner requires the FrameRunner units between the Symmetrix storage units (FrameRunner, p. 3-4). As described

above, Double-Take requires proprietary software on the server. This software required CPU cycles on the server in order to run. However, FrameRunner does not incur any CPU overhead on the server (FrameRunner, p. 2). In addition, Double-Take works with file increments. In contrast, FrameRunner mirrors the entire disk (FrameRunner, p. 2). A person of ordinary skill in the art would not combine Double-Take with FrameRunner because of these differences.

As a result of the incompatibilities of any two of the three references, none of the references would be combined together.

B. Neither Staheli, Double-Take, nor FrameRunner individually teach the elements of the appealed claims.

1. The claim of group 1 includes subject matter not disclosed by Staheli, FrameRunner, or Double-Take.

Group I consists of claim 6. Claim 6 recites:

6. The improvement of claim 1, wherein the improvement comprises all flexible mirroring characteristics of the group.

Claim 6 is dependent on claim 1. Claim 1 lists a group of five flexible mirroring characteristics. The group includes a serverless destination characteristic, a non-invasive characteristic, a disk emulation characteristic, a TCP journey line characteristic, and a multiplicity characteristic. Claim 6 includes all five of these characteristics.

Staheli, FrameRunner, or Double-Take, individually, does not teach all five flexible mirroring characteristics as recited in claim 6.

Staheli does not teach the multiplicity characteristic. The multiplicity characteristic may be either many-to-one or one-to-many. Many-to-one is defined as many local servers connected to one remote mirroring unit. One-to-many is defined as one local server with many remote mirroring units. (See Application, p. 54). Staheli does disclose using additional servers (Staheli, col. 14, lines 54-62). However Staheli only discloses using one remote system as disclosed in the patent along with a local conventional mirroring system. Staheli does not mention a many-to-one characteristic where many local servers are mirrored to one remote location, nor a one-to-many characteristic where one local server is mirrored to many remote locations.

Staheli does not teach the TCP journey line characteristic. The TCP journey line characteristic as recited in claim 1 includes a TCP client and a TCP server. Staheli only discusses telecommunication links in general (Staheli, col. 12, lines 49-57). Staheli does not disclose using TCP servers or clients.

Double-Take does not teach the non-invasive characteristic. The non-invasive characteristic includes mirroring data without software on the host specifically for remote data mirroring. In contrast, Double-Take requires the “Double Take Source Module” software on the server.

Double-Take does not disclose the disk emulation characteristic. Disk emulation is performed over the connection between the host and the local mirroring unit. Double-Take intercepts the data before it is written to the filesystem layer of the production server. This occurs a few layers before the storage subsystem bus layer. In addition, the communications between a production server and the high availability server in Double-Take is through network connections, not storage subsystem connections. The Examiner points to the high availability server as a local mirror (Office Action, p. 5, ¶3). Therefore, the connection between the local mirroring unit and the host is a network connection, not a emulated storage subsystem bus.

FrameRunner does not disclose the multiplicity characteristic. FrameRunner does show one server with two storage systems mirrored to one remote system (FrameRunner, p. 3). However, this is neither the many to one nor the one to many type of the multiplicity characteristic. Remember, many-to-one is defined as many local servers mirrored to one remote mirroring unit. One-to-many is defined as one local server mirrored to many remote mirroring units. FrameRunner discloses two servers connected to one remote site. However, this is not a many to one mirroring system. Many-to-one mirroring requires there to be mirroring. The server not connected to the EMC Symmetrix does not have storage to mirror to a remote site. Therefore, FrameRunner does not show two servers mirrored to one remote mirroring unit.

FrameRunner does not disclose the TCP journey line characteristic. FrameRunner discloses T3/E3 and ATM telecommunications links (FrameRunner, p. 2). However, FrameRunner does not disclose a TCP client or a TCP server as recited in claim 1. ATM or T3/E3 links do not require TCP clients or servers. ATM is a connection oriented protocol. TCP is a connectionless protocol. In fact, TCP can be transmitted over an ATM link. However, an

ATM link does not require TCP. See Douglas E. Comer, Internetworking with TCP/IP Volume 1 p. 303 (1995). Consequently, FrameRunner does not disclose a TCP client or a TCP server.

Instead, FrameRunner requires a dedicated point to point ESCON link. It does not have any characteristics that allow it to tolerate the latencies or delays introduced by a standard TCP/IP network. This product also requires a high bandwidth point to point dedicated telecommunications or fiber optic link in order to function. Again FrameRunner could not tolerate the latency or delays introduced by a low bandwidth TCP/IP connection.

None of the references individually discloses all five flexible mirroring characteristics. As discussed above, a person of ordinary skill in the art would not combine all of the references together, nor combine any two together. Therefore, claim 6 is patentable over Staheli, FrameRunner, and Double-Take.

2. The claims of group 2 include subject matter not disclosed by Staheli, FrameRunner, or Double-Take.

Group II consists of claims 27-45. Claim 27 is a representative claim from which claims 28-45 depend. Claim 27 recites:

27. A data mirroring system which is characterized by at least a disk emulation flexible mirroring characteristic and a many-to-one multiplicity flexible mirroring characteristic, the system for mirroring data from primary network servers having nonvolatile data stores, over journey links, to a remote nonvolatile data storage area, wherein the system comprises:

a source including at least two primary network servers, each primary server being linked through a respective local link to a respective local mirroring unit for sending mirrored data from the primary server to the local mirroring unit, each of the local mirroring units having a spoof packet generator and a nonvolatile data buffer for mirrored data, the local link including a standard storage subsystem bus and the local mirroring unit emulating a disk subsystem in communications over that bus; and

a destination including a remote mirroring unit having a destination nonvolatile storage for mirrored data received from the local mirroring units over the journey links.

As described above in Section 1, a person of ordinary skill in the art would not combine Staheli, Double-Take, or FrameRunner. Consequently the references cannot be used in

combination to describe each and every element of claim 27. In addition, neither Staheli, Double-Take, nor FrameRunner individually disclose all of the elements of claim 27.

Claim 27 includes at least two primary network servers with a local mirroring unit for each server. Staheli does not disclose more than one primary network server. Staheli discusses multiple servers in one paragraph (Staheli, col. 14, lines 54-62). Additional servers can be used, but the only additional servers Staheli discloses are additional mirrors. As a result of having only one primary network server, Staheli does not disclose more than one local mirroring unit.

Claim 27 includes a local mirroring unit for each primary network server. Double-Take does not disclose this feature. In each description of multiple production servers, there is only one high availability server. See Double-Take, p. 6, p. 7 “Scalable”, p. 8, p. 10, p. 13 “Double-Take Configurations”, and p.15. The offsite disaster recovery server is distinct from a high availability server. The offsite disaster recovery server cannot function as a local mirroring unit because it is not local to the production servers. Consequently, Double-Take discloses at most one local mirroring unit. Claim 27 requires at least two.

In addition, claim 27 includes a spoof packet generator. Double-Take does not disclose any kind of spoof packet generator.

Further, the local mirroring unit of claim 27 emulates a disk subsystem over a standard storage subsystem bus. Double-Take operates over network links (Double-Take, p. 7 “Affordable”). In addition, Double-Take “works at the OS level, rather than the disk driver level.” (Double-Take, p. 7, “Flexible”). Therefore, Double-Take does not disclose a local mirroring unit that emulates a disk subsystem as recited in claim 27.

FrameRunner does not disclose emulating a disk subsystem over a standard storage subsystem bus as recited in Claim 27. FrameRunner cites an ESCON channel as the connection between the EMC Symmetrix storage system and the FrameRunner channel adapters (FrameRunner, p. 2). It is not inherent that the ESCON channel is emulated. CLARIFY

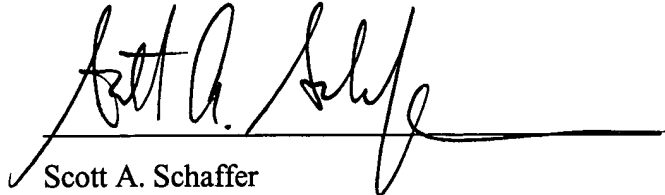
In addition, there is no mention of a spoof packet generator in FrameRunner as recited in claim 27. FrameRunner does not mention an acknowledging spoof packet as described in the specification (Application, p. 11, lines 14-16). No informative packets at all are described in FrameRunner, let alone a spoof packet. Therefore, FrameRunner does not disclose a spoof packet generator.

CONCLUSION

For the foregoing reasons, Appellant requests that the Board reverse the Examiner's rejections to Appellant's claims.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "Scott A. Schaffer", is written over a horizontal line.

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APPENDIX
37 C.F.R. § 1.192(c)(9)

The text of the claims on appeal 6 and 27-45 are as follows:

GROUP I

6. The improvement of claim 1, wherein the improvement comprises all flexible mirroring characteristics of the group.

With claim 1 reciting as follows:

1. In a computer system for mirroring data, an improvement comprising at least two flexible mirroring characteristics from a group of such characteristics, the system not necessarily having every characteristic in the group, wherein the group consists of:

a serverless destination characteristic by which the system mirrors data to a remote mirroring unit without requiring the use of a remote server attached to the remote mirroring unit;

a non-invasive characteristic by which the system mirrors data from a host through a local mirroring unit toward a remote mirroring unit without requiring on the host any software that is designed specifically for remote data mirroring;

a disk emulation characteristic by which the system mirrors data from a host to a local mirroring unit through a standard storage subsystem bus;

a TCP journey line characteristic by which the system mirrors data from a host through a local mirroring unit which operates as a TCP client over a journey line to a remote mirroring unit which operates as a TCP server; and

a multiplicity characteristic by which the system provides at least one of many-to-one mirroring and one-to-many mirroring.

GROUP II

27. A data mirroring system which is characterized by at least a disk emulation flexible mirroring characteristic and a many-to-one multiplicity flexible mirroring characteristic, the system for mirroring data from primary network servers having nonvolatile data stores, over journey links, to a remote nonvolatile data storage area, wherein the system comprises:

a source including at least two primary network servers, each primary server being linked through a respective local link to a respective local mirroring unit for sending mirrored data from the primary server to the local mirroring unit, each of the local mirroring units having a spoof packet generator and a nonvolatile data buffer for

mirrored data, the local link including a standard storage subsystem bus and the local mirroring unit emulating a disk subsystem in communications over that bus; and
a destination including a remote mirroring unit having a destination nonvolatile storage for mirrored data received from the local mirroring units over the journey links.

28. The data mirroring system of claim 27, wherein the destination nonvolatile storage comprises one disk partition for each primary network server, each disk partition holding mirrored data for the respective primary network server.

29. The data mirroring system of claim 27, wherein the destination nonvolatile storage comprises one external hard disk for each primary network server, each external hard disk holding mirrored data for the respective primary network server.

30. The data mirroring system of claim 29, wherein each external hard disk is bootable.

31. The data mirroring system of claim 27, wherein the destination nonvolatile storage comprises one RAID unit for each primary network server, each RAID unit holding mirrored data for the respective primary network server.

32. The data mirroring system of claim 31, wherein each RAID unit is hot-swappable.

33. The data mirroring system of claim 27, wherein the primary servers comprise a first primary server and a second primary server, and the first primary server has a different operating system than the second primary server.

34. The data mirroring system of claim 27, wherein the destination nonvolatile storage is sufficiently large to hold the combined current nonvolatile data of all of the primary servers.

35. The data mirroring system of claim 27, wherein the standard storage subsystem bus comprises a SCSI bus.

36. The data mirroring system of claim 27, wherein the standard storage subsystem bus comprises a fibre channel connection.

37. The data mirroring system of claim 27, wherein the standard storage subsystem bus comprises a Universal Serial Bus connection.

38. The data mirroring system of claim 27, wherein the journey link comprises an Ethernet connection.

39. The data mirroring system of claim 27, wherein the journey link comprises a TCP connection.

40. The data mirroring system of claim 27, wherein the destination does not include a server.

41. The data mirroring system of claim 27, wherein at least one of the primary network servers does not include software designed specifically for remote data mirroring.

42. The data mirroring system of claim 27, wherein the remote mirroring unit is physically separated from at least one of the primary servers by a distance of at least ten miles.

43. The data mirroring system of claim 42, wherein the remote mirroring unit is physically separated from at least one of the primary servers by a distance of at least one hundred miles.

44. The data mirroring system of claim 27, wherein at least two of the primary servers are physically separated from each other by a distance of at least ten miles.

45. The data mirroring system of claim 27, wherein at least two of the primary servers are physically separated from each other by a distance of at least one hundred miles.